COMFORT

Customised Masks for Overnight Respiratory Therapy

Project partners

Project history

Preliminary feasibility study - 2014

Review of clinical need
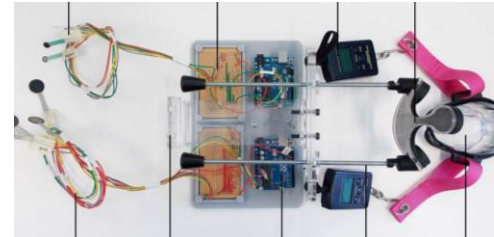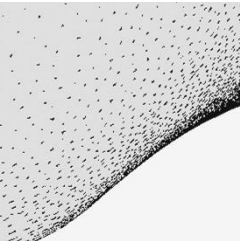
Investigating pressure mapping

PPI - opinion gathering

Investigating potential 3D printing & scanning solutions

Literature review

Prior art searches

COMPATITATIVE IMAGE: L=3D LASER SCAN R=123D CATCH IMAGE

Project overview

Non-invasive ventilation (NIV) is the delivery of breathing support via a facemask. It is used to treat people whose natural breathing is ineffective. Evidence shows that, when used long-term, it improves both quality of life and life expectancy.

Two particularly disadvantaged groups are very young infants and children with facial deformities or facial asymmetry. In these groups NIV may not be possible due to unavailability of an adequate mask.

NIV with an inadequately fitting mask leads to pressure sores, impairment of facial bone growth and significant disturbance to the sleep of the child and family due to noise from air leakage from the mask and alarms from the ventilator.
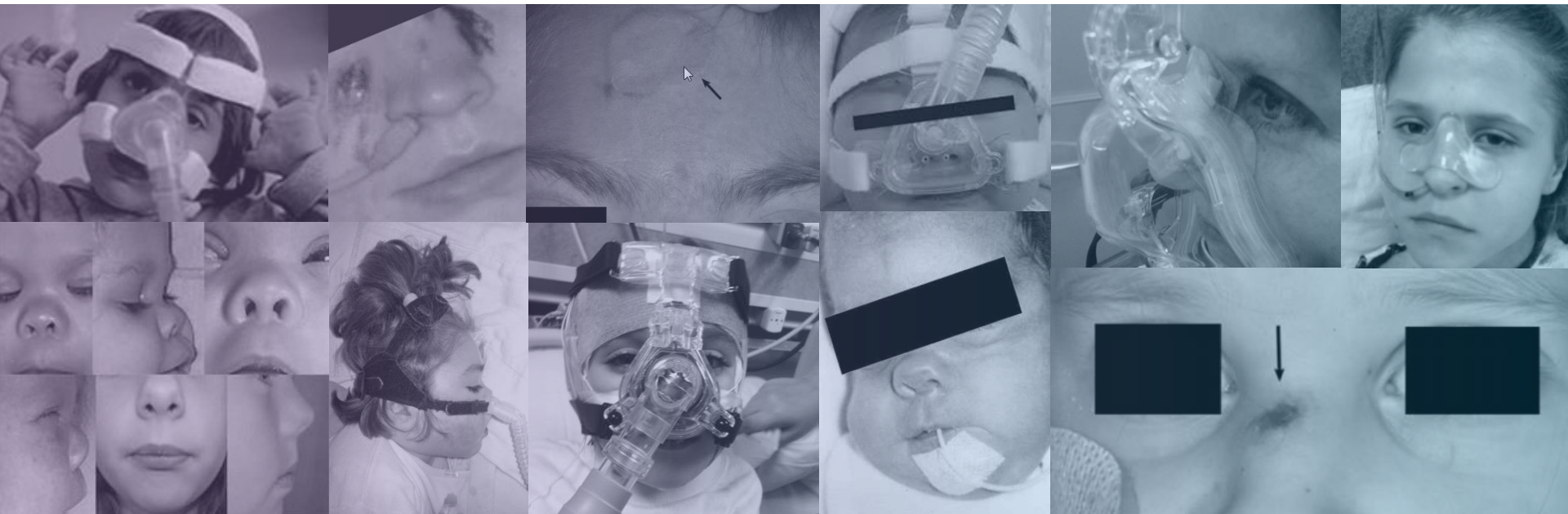
Project objectives

*"To research the use of **3D assessment and manufacturing technologies** to deliver novel **mask interfaces** to optimise mask fit to the needs of individual patients **within the framework of the NHS**."*

3D scan   >   Design   >   3D print
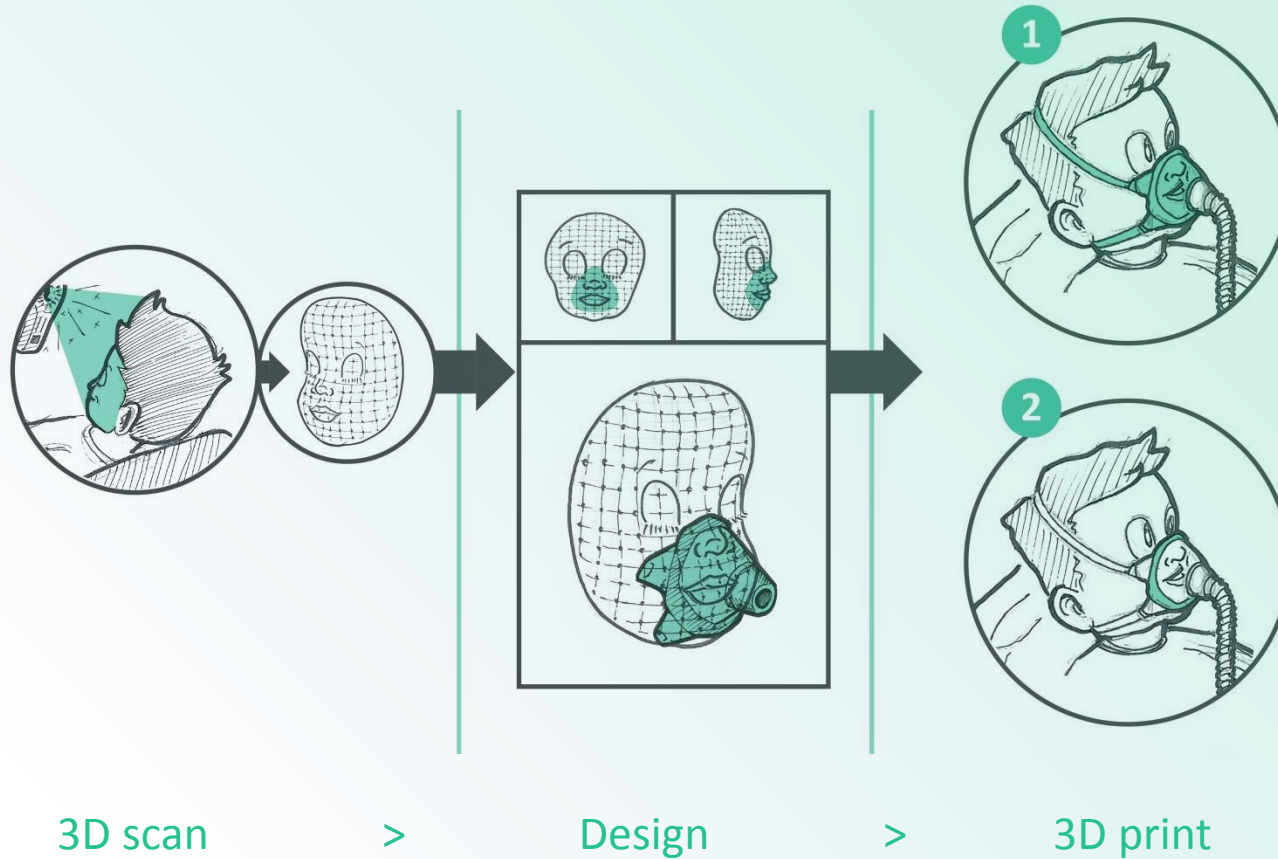
The role of the design team

Creating **things** to develop understanding and promoting discussion through **visual** communication
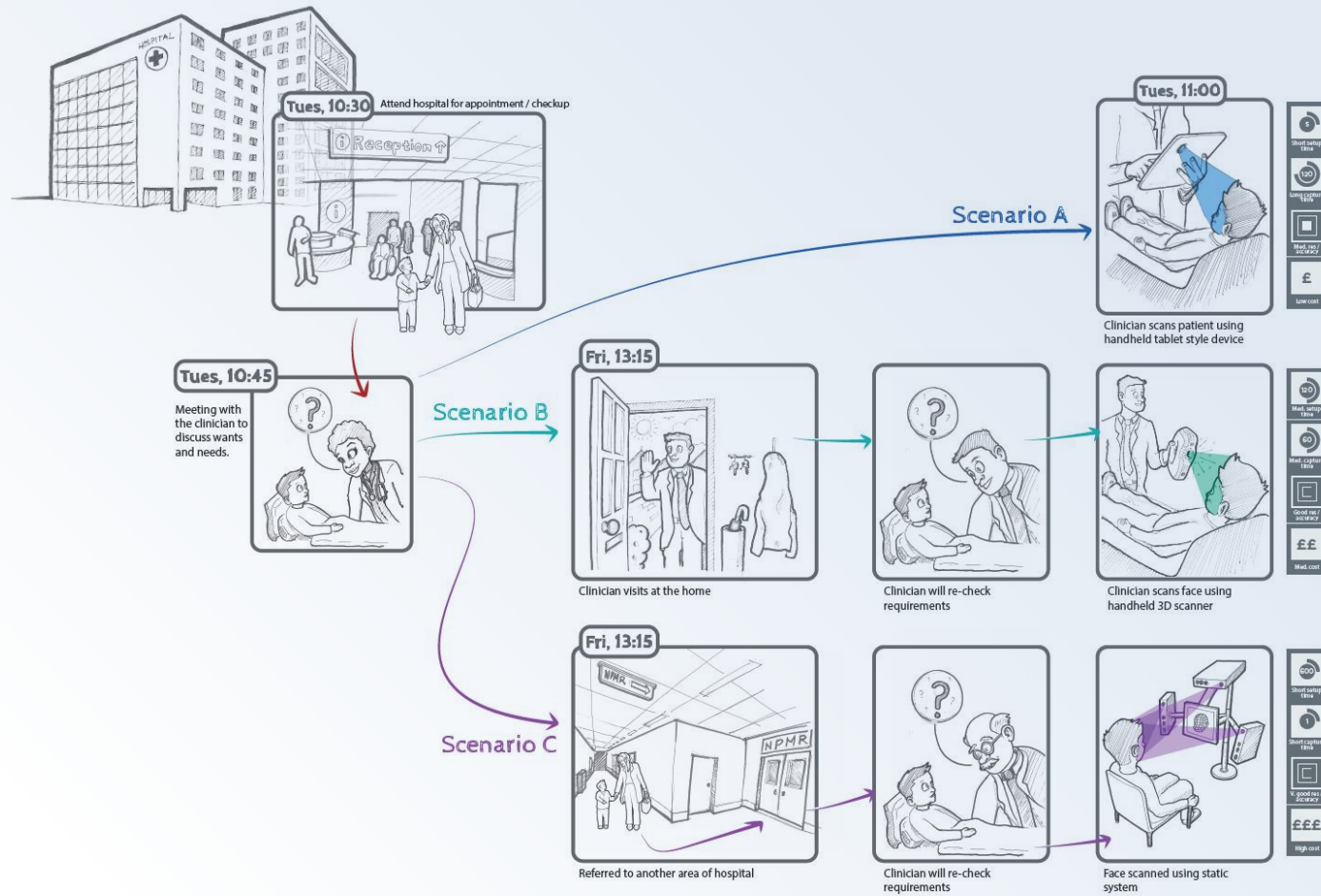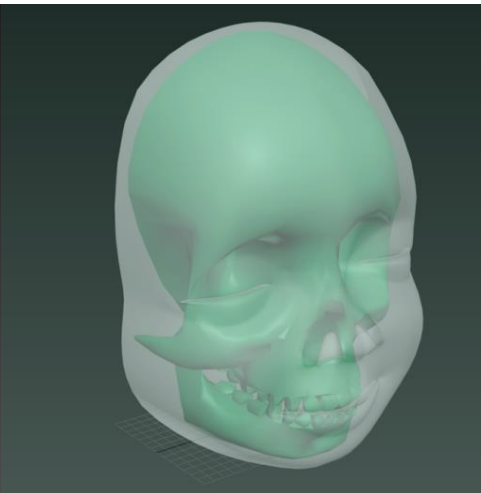

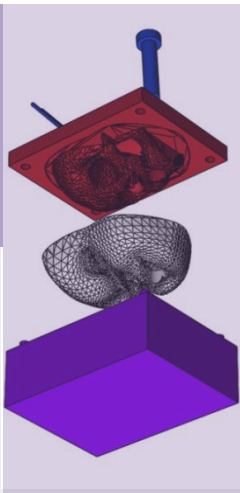Exploration of potential service delivery scenarios

The role of the design team

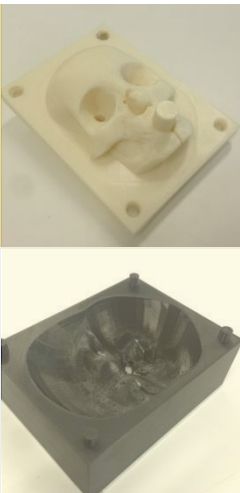Creating **things** to develop understanding and making knowledge **tangible**
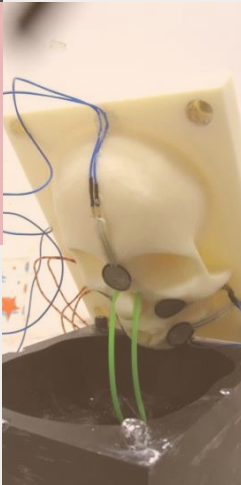
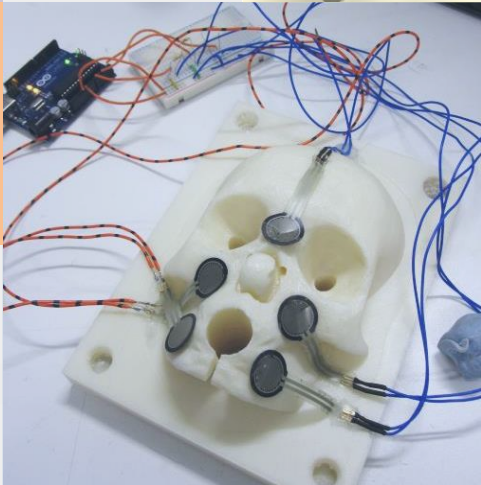

1. 3D CAD model refinement

2. Tooling preparation

3. RP tooling production

4. Arduino & FSR placement

5. Casting preparation and plan.

6. Cast silicone part

Design and build of in-vitro test head phantom

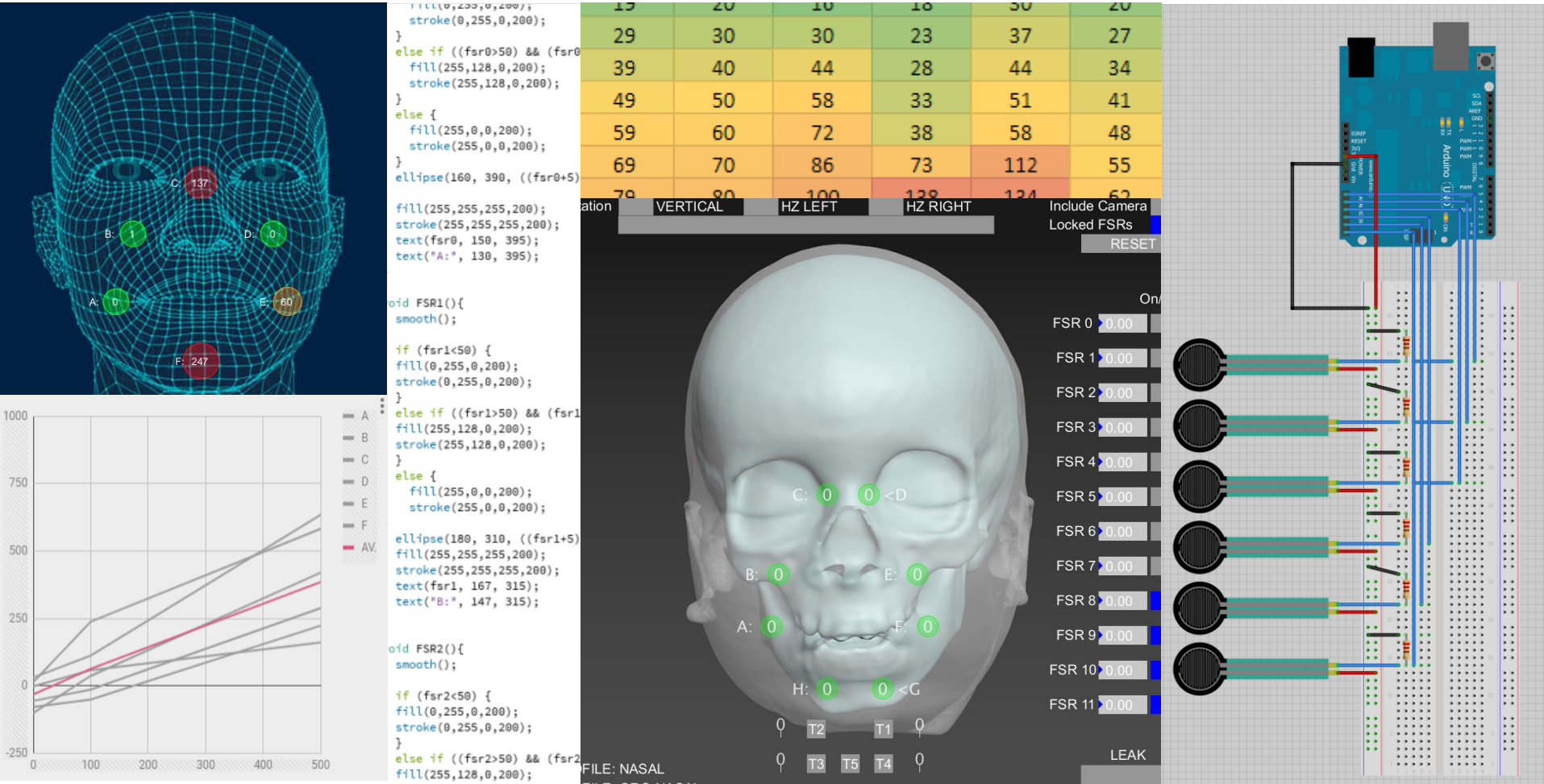# The role of the design team

Creating **things** to develop understanding and test propositions
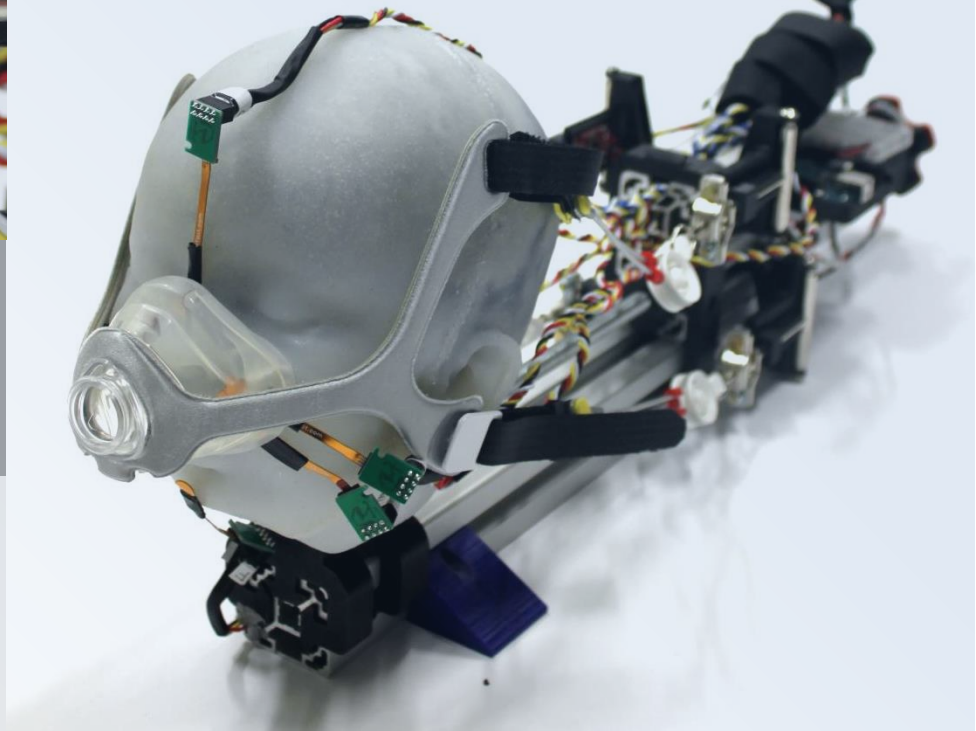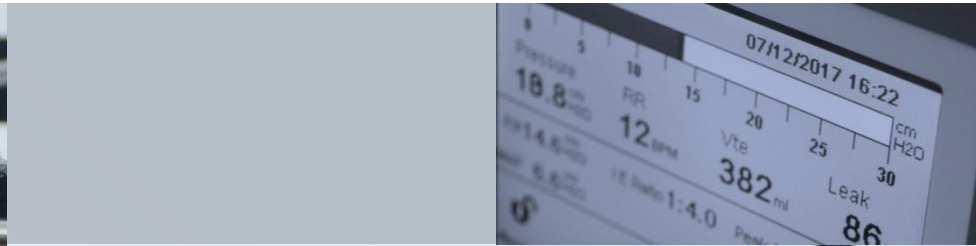
Design and build of head phantom and headgear tension rig
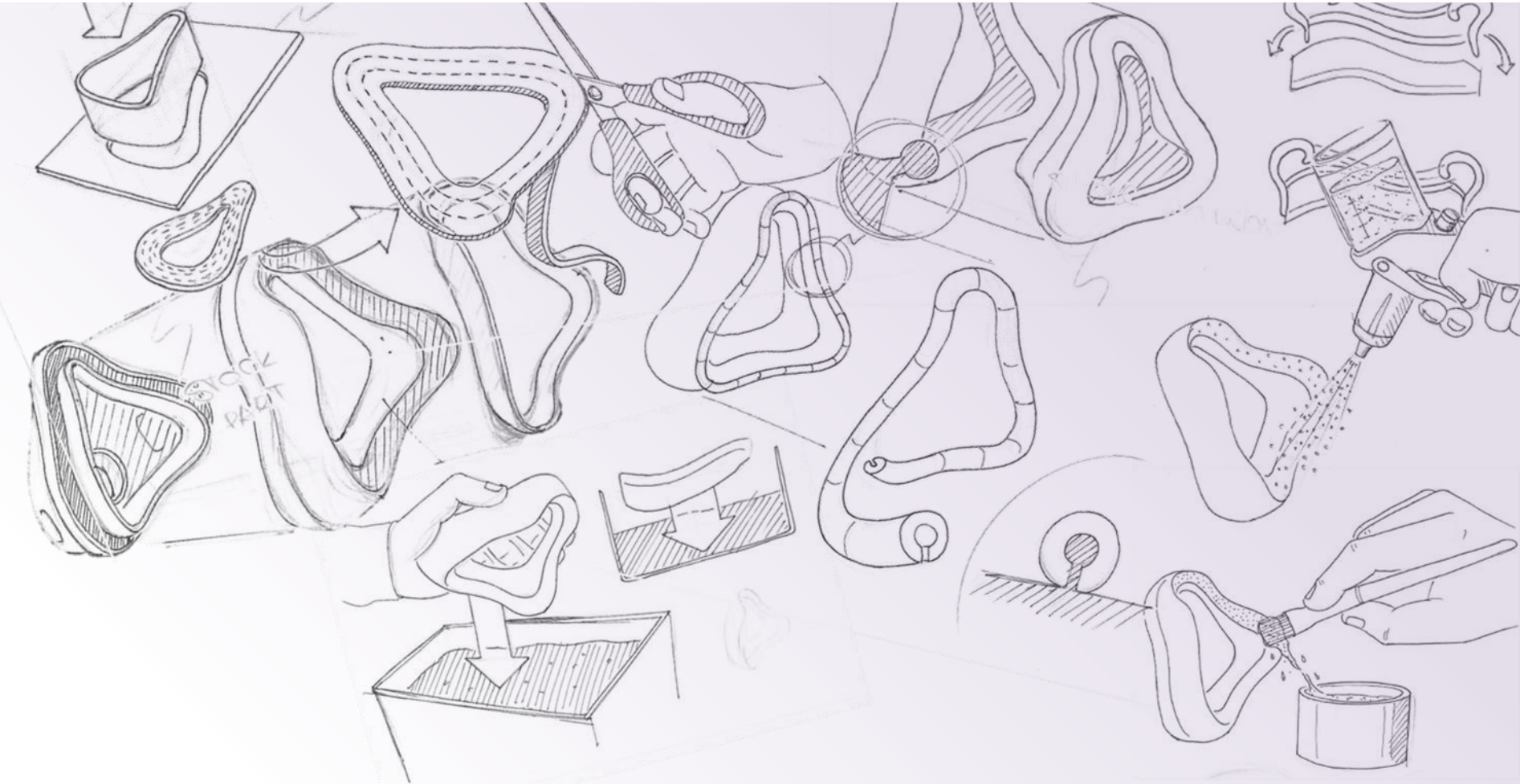
The role of the design team

Creating **things** to develop understanding and communicating **visually**

Development of custom software to visualise and record test data
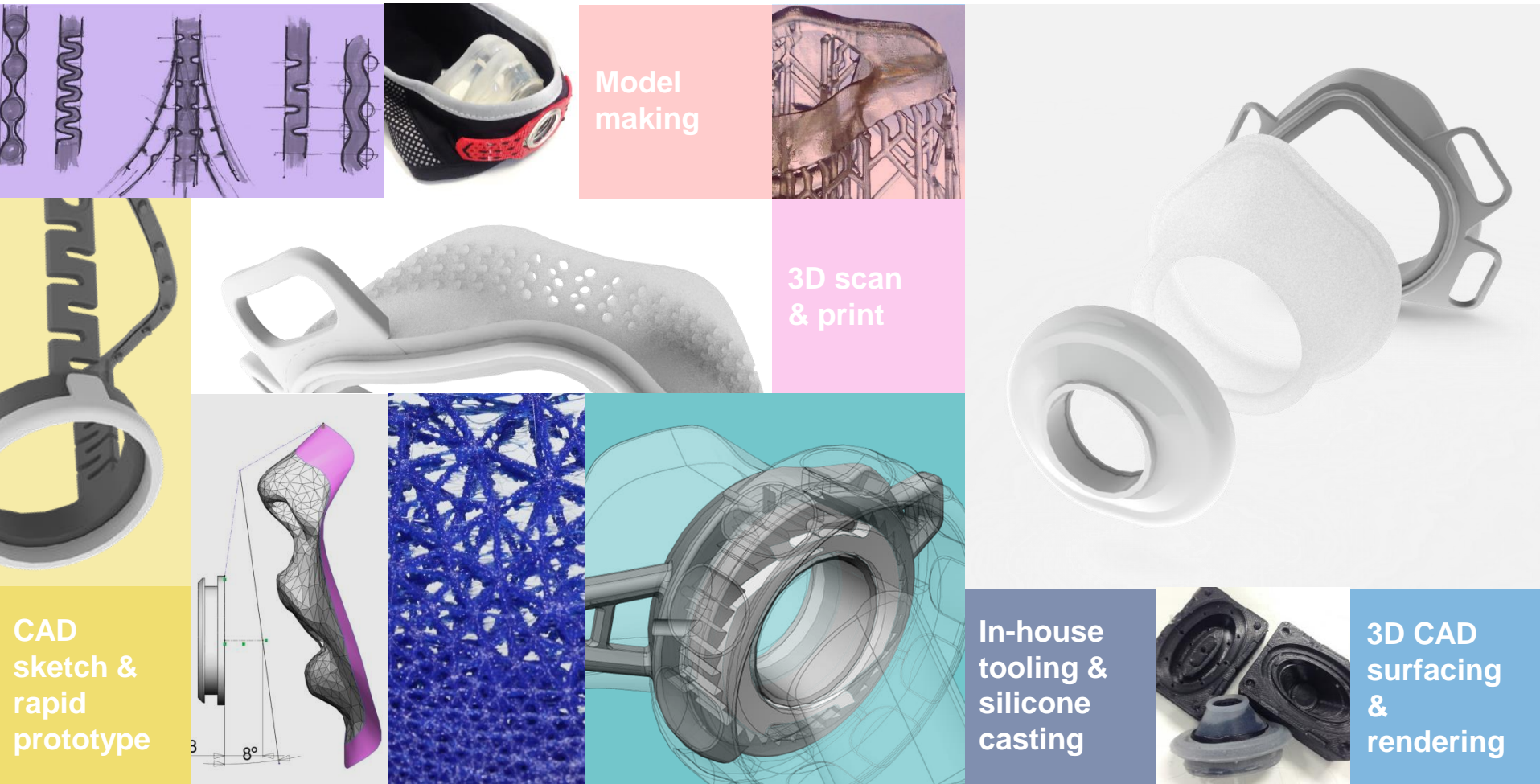
The role of the design team

Creating **things** to develop understanding. Thinking and communicating **visually**

Concept generation - sketching and prototyping

The role of the design team

Creating **things** using developed knowledge and promoting discussion with **tangible** objects

Model making

3D scan & print

CAD sketch & rapid prototype

In-house tooling & silicone casting

3D CAD surfacing & rendering

Concept generation and prototyping

The role of the design team

Creating **things** using developed knowledge and promoting discussion with **tangible** objects & **visual** communication

Feedback on mask prototypes from patients, parents and healthcare professionals

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END